

# **Introduction to Metals TMDL Regional Board Staff Report**

**TOTAL MAXIMUM DAILY LOAD FOR METALS  
LOS ANGELES RIVER AND TRIBUTARIES**



**U.S. Environmental Protection Agency  
Region 9**

**California Regional Water Quality Control Board  
Los Angeles Region**

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## TABLE OF CONTENTS

<b>1. INTRODUCTION.....</b>	<b>7</b>
<i>1.1 Regulatory Background.....</i>	<i>8</i>
<i>1.2 Environmental Setting.....</i>	<i>10</i>
<i>1.3. Elements of a TMDL.....</i>	<i>14</i>
<b>2. PROBLEM IDENTIFICATION .....</b>	<b>15</b>
<i>2.1 Water Quality Standards.....</i>	<i>15</i>
<i>2.2 Water Quality Data Review.....</i>	<i>21</i>
<b>3. NUMERIC TARGETS.....</b>	<b>26</b>
<i>3.1 Dry-Weather Targets.....</i>	<i>27</i>
<i>3.2. Wet-Weather Targets.....</i>	<i>31</i>
<b>4. SOURCE ASSESSMENT.....</b>	<b>33</b>
<b>5. LINKAGE ANALYSIS.....</b>	<b>40</b>
<i>5.1 Development of the Dry-Weather Model.....</i>	<i>40</i>
<i>5.2 Development of the Wet-Weather Model.....</i>	<i>45</i>
<b>6. POLLUTANT ALLOCATION.....</b>	<b>53</b>
<i>6.1 Dry-Weather Loading Capacity.....</i>	<i>53</i>
<i>6.2 Dry-Weather Allocations.....</i>	<i>55</i>
<i>6.3 Wet-Weather Loading Capacity.....</i>	<i>58</i>
<i>6.4 Wet-Weather Allocations.....</i>	<i>59</i>
<i>6.5 Margin of Safety.....</i>	<i>61</i>
<b>7. IMPLEMENTATION .....</b>	<b>62</b>
<i>7.1 Integrated Resources Plan .....</i>	<i>64</i>
<i>7.2 Potential Implementation Strategies.....</i>	<i>65</i>
<i>7.3 Implementation Schedule.....</i>	<i>68</i>
<i>7.4 Cost Analysis .....</i>	<i>69</i>
<b>8. MONITORING .....</b>	<b>76</b>
<i>8.1 Ambient Monitoring.....</i>	<i>77</i>
<i>8.2 Compliance Assessment Monitoring.....</i>	<i>77</i>
<i>8.3 Special Studies.....</i>	<i>80</i>
<b>10. REFERENCES.....</b>	<b>82</b>

## LIST OF TABLES

Table 1. Segments of the Los Angeles River and tributaries listed as impaired for metals.....	7
Table 2. Beneficial uses in listed reaches of the Los Angeles River (LARWQCB, 1994).....	17
Table 3. Water quality objectives established in CTR.....	19
Table 4. Coefficients used in formulas for calculating CTR standards .....	20
Table 5. Summary of ambient water quality data for total metals relative to chronic values.....	21
Table 6. Summary of ambient water quality data for total metals relative to acute values. ....	22
Table 7. Summary of stormwater data for dissolved metals relative to chronic and acute criteria.. .....	22
Table 8. Summary of hardness data for specific reaches of the Los Angeles River during dry weather.. .....	28
Table 9. Numeric targets for TMDL during dry weather (adjusted for hardness by reach).. ....	29
Table 10. Relationship between dissolved and total metals in dry-weather data.....	30
Table 11. Range of potential numeric targets for wet weather.. .....	32
Table 12. Relationship between dissolved and total metals expressed as a percent. ....	32
Table 13. Annual metals loadings from three POTWs .....	36
Table 14. Summary of permits in Los Angeles River Watershed.....	36
Table 15. Relative Loading (%) of metals by rource to the Los Angeles River during dry- weather conditions.....	37
Table 16. Seasonal stormwater loadings (kg/yr) to Los Angeles River watershed.....	39
Table 17. Estimates of direct and indirect deposition (kg/year) .....	40
Table 18. Los Angeles River segments modeled for linkage analysis.....	41
Table 19. Flows used in the calibration and validation of the dry-weather model. ....	42
Table 20. Flow and concentrations for point source discharges used in model calibration.....	43
Table 21. Flows and concentrations for tributaries used in model calibration .....	43
Table 22. Flows and concentrations for point source discharges used in model validation .....	44
Table 23. Flows and concentrations for tributaries used in model validation.....	44
Table 24. Land use distribution in the watershed.....	47
Table 25. Hourly rainfall data. ....	48
Table 26. Stream gage stations used for calibration and validation of flow data. ....	50

Table 27. Volumes (acre-feet) and relative error of modeled flows versus observed flow for the Los Angeles River at Wardlow (10/1/1989 – 3/3/1998) .....	51
Table 28. A comparison of different load allocations for entire river based on three critical flows at Wardlow. ....	54
Table 29. Dry-weather loading capacity for the Los Angeles River and listed tributaries based on area weighting of median flows at Wardlow (145 cfs). ....	54
Table 30. Proposed waste load allocations for the three POTWs required to meet TMDL targets.....	55
Table 31. Remaining dry-weather waste load capacity for the Los Angeles River and listed tributaries to be allocated among stormwater and other permittees.....	57
Table 32. Concentration-based dry-weather waste load allocations .....	58
Table 33. Concentration-based wet-weather waste load allocations .....	61
Table 34. Land use contributions to total metal loads from surface runoff from the Los Angeles River watershed.....	63
Table 35. Implementation Schedule.....	69
Table 36. Estimated costs for two types of street sweepers .....	71
Table 37. Annualized sweeper costs, including purchase price and operation and maintenance costs (\$/curb mile/year).....	72
Table 38. Estimated costs for infiltration trenches.....	74
Table 39. Estimated costs for Austin and Delaware sand filters.....	75
Table 40. Total estimated costs of phased implementation approach.....	75
Table 41. Ambient monitoring points.....	77

## LIST OF FIGURES

Figure 1. Map of the Los Angeles River watershed and listed reaches. ....	86
Figure 2. Sampling stations in the Los Angeles River watershed.....	87
Figure 3. Data collected by the City of Los Angeles Watershed Monitoring Program. ....	88
Figure 4. Location of stream gages in the Los Angeles River watershed.....	89
Figure 5. Validation of dry-weather hydrography. ....	90
Figure 6. Calibration and validation of the dry-weather model	91
Figure 7. Los Angeles River sub-watershed delineation used in wet-weather model. ....	93
Figure 8. Location of precipitation and meteorological stations used in the wet-weather model	94
Figure 9a. Validation of wet-weather hydrography. Comparison of monthly flows. ....	95
Figure 9b. Validation of wet-weather hydrography. Regression of monthly flows.....	95
Figure 10. Flows at Wardlow (1998-2000).....	96
Figure 11a. Load-duration curve for <u>copper</u> .....	97
Figure 11b. Load-duration curve for <u>lead</u> .....	98
Figure 11c. Load-duration curve for <u>zinc</u> .....	99
Figure 11d. Load-duration curve for <u>cadmium</u> .....	100
Figure12. Regression analysis of storm flows verses rainfall for the Los Angeles River (below Wardlow Rd.).....	101

## LIST OF ACRONYMS

ACF	Acute Conversion Factor
BLM	Biotic Ligand Model
BMPs	Best Management Practices
Caltrans	California Department of Transportation
CCF	Chronic Conversion Factor
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
CTR	California Toxics Rule
CWA	Clean Water Act
EFDC1D	Environmental Fluid Dynamics Code 1-D
EMC	Event Mean Concentration
FHWA	Federal Highway Administration
GWR	Ground Water Recharge
HSPF	Hydrologic Simulation Program-Fortran
IPWP	Integrated Plan for the Wastewater Program
IRP	Integrated Resources Plan
LACDPW	Los Angeles County Department of Public Works
LARWQCB	Los Angeles Regional Water Quality Control Board
LSPC	Loading Simulation Program in C++-
MCLs	Maximum Contaminant Levels
MGD	Million Gallons Per Day
MS4	Municipal Separate Storm Sewer System
MUN	Municipal Supply
NCDC	National Climatic Data Center
NHD	National Hydrography Dataset
NPDES	National Pollutant Discharge Elimination System
POTW	Publicly Owned Wastewater Treatment Works
SCAG	Southern California Association of Governments



SCCWRP	Southern California Coastal Water Research Project
SIP	State Implementation Plan
TMDL	Total Maximum Daily Loads
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOCs	Volatile Organic Compounds
WASP5	Water Quality Analysis Simulation Program
WDRs	Waste Discharge Requirements
WER	Water Effect Ratio
WLA	Waste Load Allocation
WMP	Watershed Monitoring Program
WQBELs	Water Quality Based Effluent Limits
WQOs	Water Quality Objectives
WRPs	Water Reclamation Plants

## 1. INTRODUCTION

Segments of the Los Angeles River and its tributaries exceed water quality objectives for a variety of metals. These segments (*i.e.*, reaches) of the Los Angeles River and tributaries are included on the California 303(d) list of impaired waterbodies (LARWQCB, 1998a and 2002). The Clean Water Act requires a Total Maximum Daily Load (TMDL) be developed to restore the impaired waterbodies, including the Los Angeles River, to its full beneficial uses. Table 1 summarizes the stream reaches of the Los Angeles River watershed included on the California 303(d) list for metals.

**Table 1. Segments of the Los Angeles River and tributaries listed as impaired for metals (LARWQCB, 1998a and 2002)**

Listed Waterbody Segment	Copper	Cadmium	Lead	Zinc	Aluminum	Selenium
Aliso Canyon Creek						X
Dry Canyon Creek						N
McCoy Canyon Creek						N
Monrovia Canyon Creek			X			
Los Angeles River Reach 4 (Sepulveda Dam to Riverside St.)			X			
Tujunga Wash (from Hansen Dam to Los Angeles River)	X					
Burbank Western Channel		X				
Los Angeles River Reach 2 (from Figueroa St. to Carson St.)			X			
Rio Hondo (from the Santa Ana Fwy to Los Angeles River)	X		X	X		
Compton Creek	X		X			
Los Angeles River Reach 1 (from Carson St. to estuary)	N	N	X	N	N	

X: listed as impaired in 1998 303(d) list and part of analytical unit 13. N: New waterbody listing based on 2002 303(d) list, not part of analytical unit 13

The goal of this TMDL is to develop pollutant allocations for metals and an implementation plan to meet the water quality objectives in the Los Angeles River and listed tributaries. This TMDL complies with 40 CFR 130.2 and 130.7, Section 303(d) of the Clean Water Act and U.S.

Environmental Protection Agency (EPA) guidance for developing TMDLs in California (USEPA, 2000a). This document summarizes the information used by the EPA and the California Regional Water Quality Control Board, Los Angeles Region (Regional Board) to develop allocations for metals. The TMDL also includes an implementation plan and cost estimate to achieve the allocations and attain water quality objectives (WQOs) in the Los Angeles River. The California Water Code (Porter-Cologne Water Quality Control Act) requires that an implementation plan be developed to achieve water quality objectives. Figure 1 shows the waterbodies addressed in this TMDL.

## **1.1 Regulatory Background**

Section 303(d) of the Clean Water Act (CWA) requires that each State “shall identify those waters within its boundaries for which the effluent limitations are not stringent enough to implement any water quality objective applicable to such waters.” The CWA also requires states to establish a priority ranking for waters on the 303(d) list of impaired waters and to establish TMDLs for such waters.

The elements of a TMDL are described in 40 CFR 130.2 and 130.7 and Section 303(d) of the CWA, as well as in the U.S. Environmental Protection Agency guidance (USEPA, 2000a). A TMDL is defined as the “sum of the individual waste load allocations for point sources and load allocations for nonpoint sources and natural background” (40 CFR 130.2) such that the capacity of the waterbody to assimilate pollutant loads (the loading capacity) is not exceeded. A TMDL is also required to account for seasonal variations and include a margin of safety to address uncertainty in the analysis (USEPA, 2000).

States must develop water quality management plans to implement the TMDL (40 CFR 130.6). The EPA has oversight authority for the 303(d) program and is required to review and either approve or disapprove the TMDLs submitted by states. In California, the State Water Resources Control Board (State Board) and the nine Regional Water Quality Control Boards are responsible for preparing lists of impaired waterbodies under the 303(d) program and for preparing TMDLs, both subject to EPA approval. If EPA disapproves a TMDL submitted by a state, EPA is

required to establish a TMDL for that waterbody. The Regional Boards also hold regulatory authority for many of the instruments used to implement the TMDLs, such as the National Pollutant Discharge Elimination System (NPDES) permits and state-specified Waste Discharge Requirements (WDRs).

The Regional Board identified over 700 waterbody-pollutant combinations in the Los Angeles Region requiring TMDLs (LARWCQB, 1996, 1998a). These are referred to as “listed” or “303(d) listed” waterbodies or waterbody segments. A schedule for development of TMDLs in the Los Angeles Region was established in a consent decree (Consent Decree) approved on March 22, 1999 (Heal the Bay Inc., et al. v. Browner, C 98-4825 SBA). For the purpose of scheduling TMDL development, the decree combined the more than 700 waterbody-pollutant combinations into 92 TMDL analytical units. The 303(d) list was updated in 2002. These updates and changes are not reflected in the Consent Decree.

This TMDL addresses Analytical Unit #13 of the Consent Decree which consists of segments of the Los Angeles River and tributaries with impairments by metals (cadmium, copper, lead, selenium, and zinc). Table 1 identifies the listed waterbodies by the metals causing impairments. The Consent Decree schedule requires that this TMDL be completed by March 22, 2004. If the Regional Board fails to develop the TMDL, EPA must promulgate the TMDL by March 22, 2005. It is the Regional Board’s intent to complete this TMDL prior to EPA promulgation. The 2002 303(d) listings approved in 2003 are not required to be addressed per the Consent Decree; however where appropriate, this TMDL addressed those listings as well.

This report presents the TMDL for metals and summarizes the analyses performed by EPA and the Regional Board to develop this TMDL. This report does not address the metals TMDLs required for four lakes in the Los Angeles River watershed as part of Analytical Unit #20. These four lakes (Lake Calabasas, Echo Lake, Lincoln Park Lake and Peck Road Lake) are not hydrologically connected to the Los Angeles River or the listed tributaries. The TMDLs for these lakes are not scheduled in the Consent Decree but must be established by March 22, 2012. This report does not address metals impairments for Los Angeles Harbor or San Pedro Bay

required under Analytical Units #75 and #78, respectively. These TMDLs have not been scheduled in the Consent Decree.

## **1.2 Environmental Setting**

The Los Angeles River flows for 55 miles from the Santa Monica Mountains at the western end of the San Fernando Valley to Queensway Bay located between the Port of Long Beach and the City of Long Beach. It drains a watershed with an area of 834 square miles. Approximately 44% of the watershed area can be classified as forest or open space. These areas are primarily within the headwaters of the Los Angeles River in the Santa Monica, Santa Susana, and San Gabriel Mountains, including the Angeles National Forest, which comprises 250 square miles of the watershed. Approximately 36% of the land use can be categorized as residential, 10% as industrial, 8% as commercial, and 3% as agriculture, water and other. The more urban uses are found in the lower portions of the watershed.

The natural hydrology of the Los Angeles River Watershed has been altered by channelization and the construction of dams and flood control reservoirs. The Los Angeles River and many of its tributaries are lined with concrete for most or all of their lengths. Soft-bottomed segments of the Los Angeles River occur where groundwater upwelling prevented armoring of the river bottom. These areas typically support riparian habitat.

The mainstem of the Los Angeles River begins by definition at the confluence of Arroyo Calabasas (which drains the northeastern portion of the Santa Monica Mountains) and Bell Creek (which drains the Simi Hills). McCoy Canyon Creek and Dry Canyon Creek (listed for selenium) are tributary to Arroyo Calabasas. The river flows east from its origin along the southern edge of the San Fernando Valley. The Los Angeles River also receives flow from Browns Canyon, Aliso Creek (listed for selenium) and Bull Creek which drain the Santa Susana Mountains. The lower portions of Arroyo Calabasas and Bell Creek are channelized. Browns Canyon, Aliso Creek and Bull Creek are completely channelized.

Reach 5 of the Los Angeles River runs through Sepulveda Basin. The Sepulveda Basin is a 2,150-acre open space designed to collect floodwaters during major storms. Because the area is periodically inundated, it remains in natural or semi-natural conditions and supports a variety of low-intensity land uses. The D.C. Tillman Wastewater Reclamation Plant, a publicly owned wastewater treatment works (POTW) operated by the City of Los Angeles, discharges directly to the Los Angeles River just below the dam and also via two lakes in the Sepulveda Basin that are used for recreational and wildlife habitat. The POTW has a treatment design capacity of 80 million gallons per day (mgd) and contributes a substantial flow to the Los Angeles River. There are no listings for metals in Reach 5 of the Los Angeles River.

Reach 4 of the Los Angeles River runs from Sepulveda Dam to Riverside Street. This section of the river is listed for lead. Pacoima Wash and Tujunga Wash are the two main tributaries to this reach. Both tributaries drain portions of the Angeles National Forest in the San Gabriel Mountains. Pacoima Wash is channelized below Lopez Dam to the Los Angeles River. Tujunga Wash (listed for copper) is channelized for the 10-mile reach below Hansen Dam. Some of the discharge from Hansen Dam is diverted to spreading grounds for groundwater recharge, but most of the flow enters the channelized portion of the stream.

Reach 3 of the Los Angeles River, which runs from Riverside Street to Figueroa Street, is not listed for metals. The two major tributaries to this reach are the Burbank Western Channel and Verdugo which drain the Verdugo Mountains. Both tributaries are channelized. The Western Channel receives flow from the Burbank Water Reclamation Plant, a POTW with a design capacity of 9 mgd. Burbank Western Channel is listed for cadmium.

At the eastern end of the San Fernando Valley, the Los Angeles River turns south around the Hollywood Hills and flows through Griffith Park and Elysian Park in an area known as the Glendale Narrows. This area is fed by natural springs during periods of high groundwater. The river is channelized and the sides are lined with concrete. The river bottom in this area is unlined because the water table is high and groundwater routinely discharges into the channel, in varying volumes depending on the height of the water table. The Los Angeles-Glendale Water

Reclamation Plant, operated by the City of Los Angeles, has a design capacity of 20 mgd and discharges to the Los Angeles River in the Glendale Narrows.

Reach 2 of the Los Angeles River, which runs from Figueroa Street to Carson Street, is listed for lead. The first major tributary below the Glendale Narrows is the Arroyo Seco, which drains areas of Pasadena and portions of the Angeles National Forest in the San Gabriel Mountains. In wet periods, rising stream flows in the Los Angeles River above Arroyo Seco have been related to the increase of rising groundwater. There is up to 3,000 acre-feet of recharge from the Pollock Well Field area that adds to the rising groundwater. For the 2000-01 water year, the total rising groundwater flow was estimated at 3,900 acre-feet (ULARA Watermaster Report, 2000-2001 Water Year, May 2002).

The next major tributary is the Rio Hondo. The Rio Hondo and its tributaries drain a large area in the western portion of the watershed. Flow in the Rio Hondo is managed by the Los Angeles County Department of Public Works (LACDPW). At Whittier Narrows, flow from the Rio Hondo can be diverted to the Rio Hondo Spreading Grounds. During dry weather, virtually all the water in the Rio Hondo goes to groundwater recharge, so little or no flow exits the spreading grounds to Reach 1 of the Rio Hondo. During storm events, Rio Hondo flow that is not used for spreading, reaches the Los Angeles River. This flow is comprised of both stormwater and treated wastewater effluent from the Whittier Narrows Water Reclamation Plant. Reach 1 of the Rio Hondo is listed for copper, lead, and zinc. Monrovia Canyon Creek is also listed for lead. This creek, located in the foothills of the San Gabriel Mountains in the National Forest, is a tributary to Sawpit Creek which runs into Peck Lake and ultimately to Rio Hondo Reach 2 above the spreading grounds.

Reach 1 of the Los Angeles River, which runs from Carson Street to the estuary, was listed for lead in 1998. Listings for aluminum, copper, cadmium, and zinc were added in 2002 based on exceedances of standards in stormwater samples. Compton Creek (listed for copper and cadmium) is the last large tributary to the system before the river enters the estuary. The creek is channelized for most of its 8.5 mile length. It receives up to 720 mgd of hydrotest and stormwater from Southern California Edison Company on an intermittent basis.